CALIFORNIA DEPARTMENT OF HEALTH SERVICES
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

July 2006

Technical Report No. 06-19

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of July, 2006. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at sites between San Luis Obispo and Ventura counties during July (Figure 1). The distribution of this

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during July, 2006.

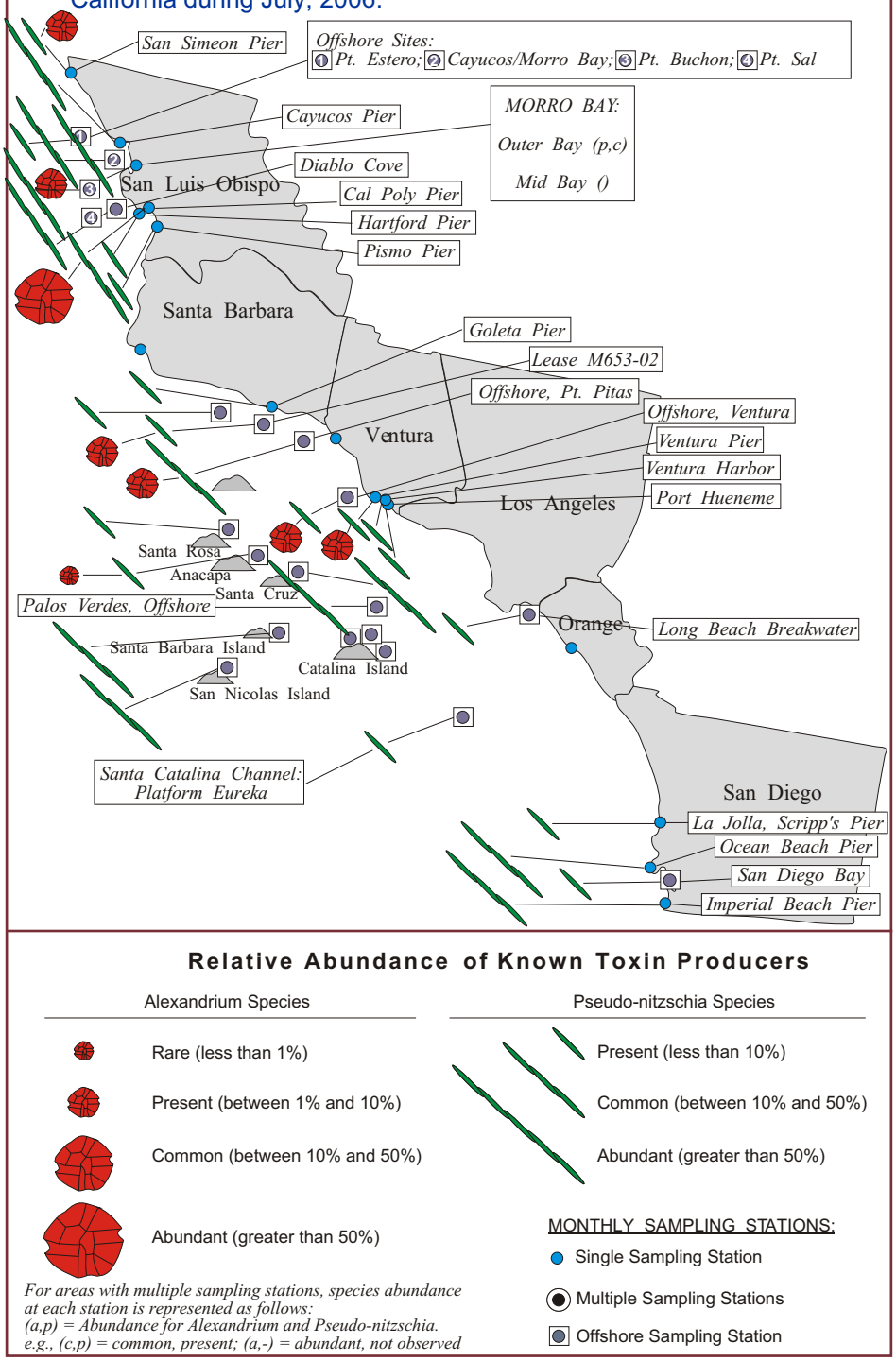
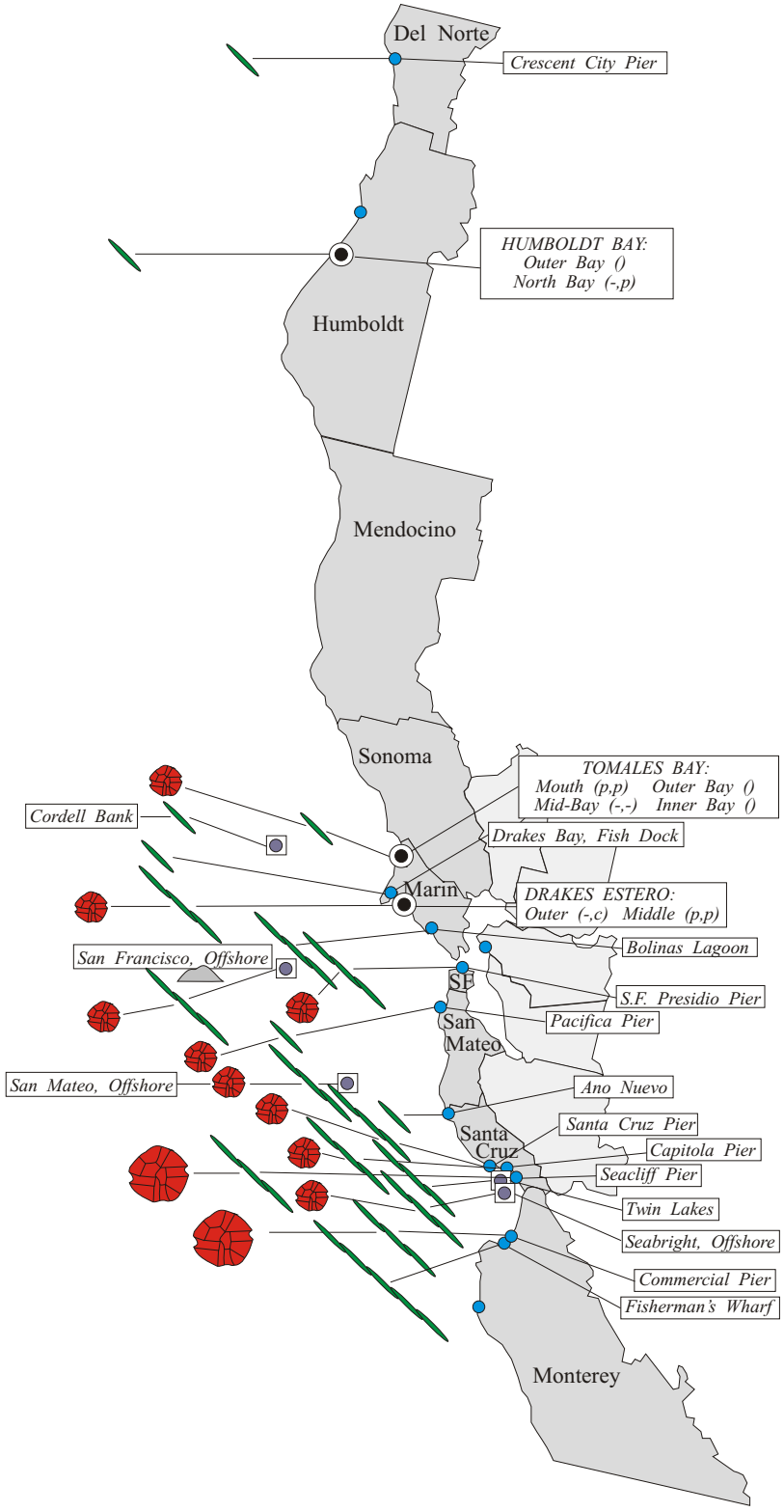


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during July, 2006.



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dinoflagellate was similar to observations in June, however the relative abundance increased at several locations. The highest cell numbers were observed at the Cal Poly Pier (July 4) and San Simeon Pier (July 27), both in San Luis Obispo County. This marks the fifth consecutive month that *Alexandrium* has been observed along a significant portion of the Southern California coast. PSP toxins were not detected in any shellfish samples from Southern California during July.

Domoic Acid

Pseudo-nitzschia continued to be observed along the entire Southern California coast in July (Figure 1). The distribution was similar to observations in June but the relative abundance increased slightly in some areas. Cell numbers increased most noticeably at sampling sites offshore near the Channel Islands, as well as in southern San Diego County. Despite the increased relative abundance in these areas, this diatom was not a dominant species in the phytoplankton assemblage. *Pseudo-nitzschia* made up less than 25 percent of the total cell numbers at any location and was typically less that 10 percent of the assemblage. Domoic acid was not detected in any shellfish samples collected in July (Figure 3).

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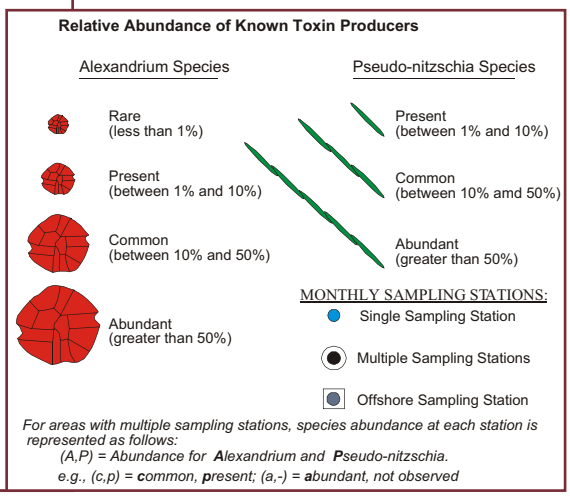
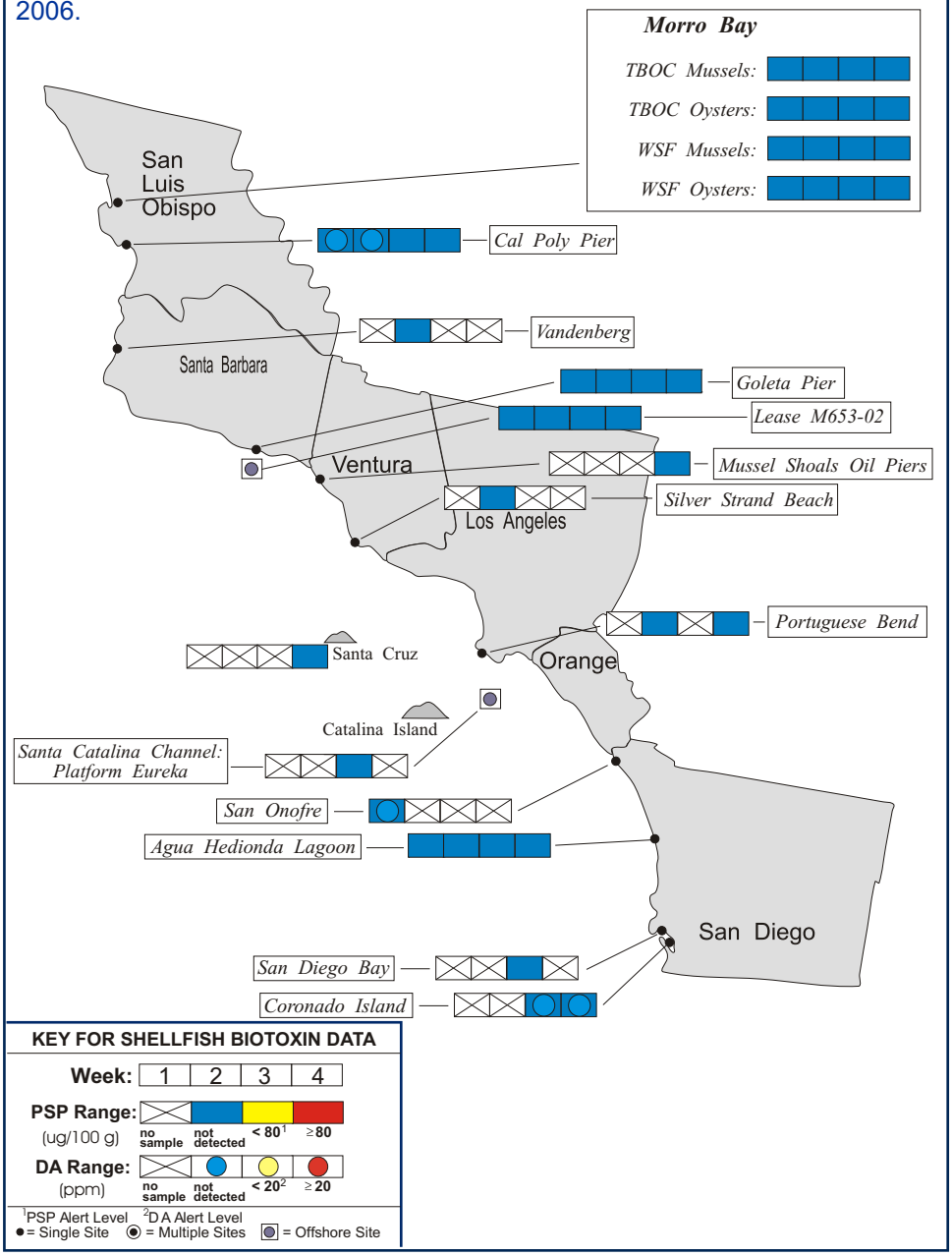


Figure 3. Distribution of shellfish biotoxins in Southern California during July, 2006.



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Non-toxic Species

The Southern California coast was characterized by a mix of diatoms (*Chaetoceros*, *Thalassiosira*) and dinoflagellates (*Ceratium, Prorocentrum*). The diatom *Eucampia* was common along the San Luis Obispo coast, with *Rhizosolenia* more common from Santa Barbara through San Diego counties (including the Channel Islands and Catalina Island).

Northern California Summary:

Paralytic Shellfish Poisoning

The distribution of *Alexandrium* in July was similar to observations in June (Figure 2). The relative abundance increased at two locations in Monterey Bay: Seacliff Pier (Santa Cruz County) and the Commercial Pier in Monterey. The highest relative abundances of *Alexandrium* observed in July were at these same two sites (July 13 and July 5, respectively), as well as at the entrance to Tomales Bay (July 2). *Alexandrium* was also observed in samples collected offshore of San Francisco and San Mateo counties by the Gulf of the Farallones National Marine Sanctuary (GFNMS).

PSP toxins above the alert level were

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

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(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

(Continued from Page 3)

detected in sentinel mussel samples from Santa Cruz Pier throughout the month. PSP toxin concentrations increased through the first three weeks of July at this site, reaching 316 ug by July 19. A low level of these toxins was also detected in mussels from Pescadero Beach in San Mateo County (July 26).

Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in June, however the relative abundance increased at some locations (Figure 2). This diatom was observed at sampling stations between Del Norte and Monterey counties. Increases in relative abundance were observed in samples from Marin (Bolinas Lagoon and Drakes Estero), Santa Cruz (Seacliff Pier), and Monterey (Commercial Pier, Fisherman's Wharf) counties. *Pseudo-nitzschia* was also common offshore of San Mateo and San Francisco in samples collected by the GFNMS. The highest relative abundances were observed in samples from Seacliff Pier (July 13) and Monterey Fisherman's Wharf (July 14). A low level of domoic acid was detected in sentinel mussels from the Santa Cruz Pier on July 12 (6 ppm).

Non-toxic Species

A mixture of diatoms (*Chaetoceros*, *Skeletonema*) and dinoflagellates (*Ceratium*, *Prorocentrum*) were observed along the Northern California coast.

QUARANTINES:

On March 24 a health advisory was issued for San Diego through San Luis Obispo counties. This advisory was modified and currently only applies to

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Figure 4. Distribution of shellfish biotoxins in Northern California during July, 2006.

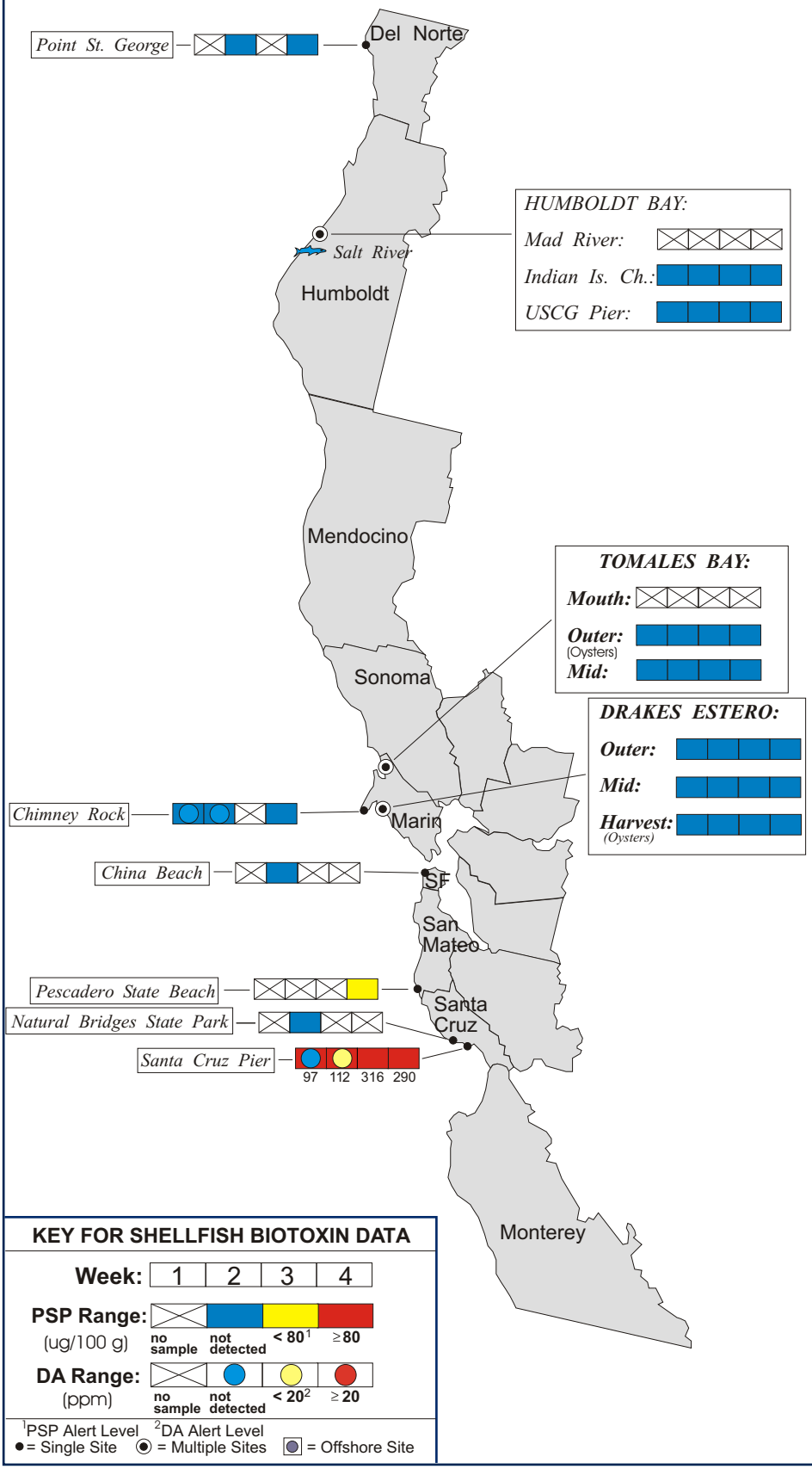

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during July, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	8
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	5
	CDHS Marine Biotoxin Monitoring Program	3
	Marin Oyster Company	1
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	5
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Williams Shellfish Company	8
	California Polytechnic State University	4
	Tomales Bay Oyster Company	6
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	4
	Vanderberg AFB	1
Ventura	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	2
Orange	Aquarium of the Pacific, Long Beach	1
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	1
	CDHS Volunteer (Steve Crooke)	4

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Ventura County and the Channel Island region. This advisory warns the public to avoid harvesting and consuming the following seafoods: all sport-harvested bivalve shellfish, sardines and anchovies. Consumers should also avoid the organs or viscera of lobster or crab taken from this region.

The annual quarantine on the sport-harvesting of mussels went into effect on May 1. The annual mussel quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries. Routine biotoxin monitoring is maintained throughout this period. The annual quarantine does not affect the certified commercial shellfish growing areas in California. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health.

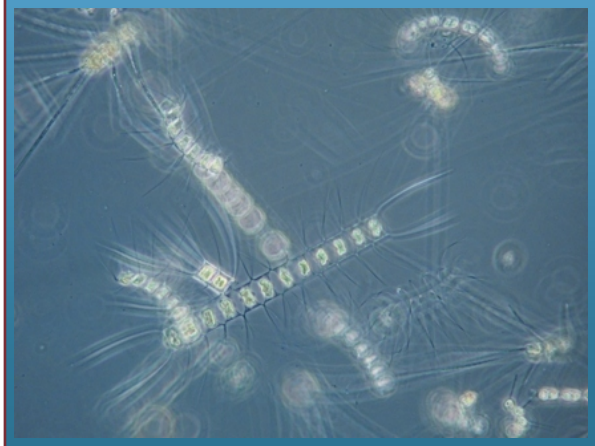
Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

Sportharvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 prior to gathering and consuming shellfish.

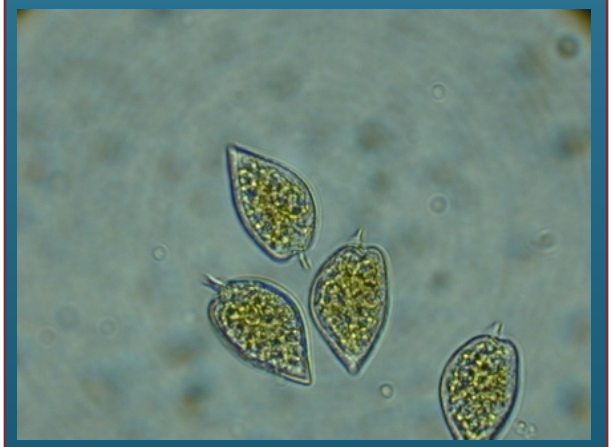
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during July, 2006.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	Gulf of the Farallones National Marine Sanctuary	1
Marin	CDHS Volunteers (Brent Anderson, Marjorie Siegel, Mary Von Toksdorf, Cal Strobel, Richard Plant)	12
	Drakes Bay Oyster Company	8
	CDHS Marine Biotoxin Monitoring Program	4
	Audubon California	1
Contra Costa	CDHS Marine Biotoxin Monitoring Program	1
San Francisco	CDHS Volunteers (Eugenia McNaughton, Carol Keiper)	4
	Gulf of the Farallones National Marine Sanctuary	5
San Mateo	Marine Mammal Center Volunteer (Stan Jensen)	4
	San Mateo County Environmental Health Department	1
	U.C. Santa Cruz	3
	Gulf of the Farallones National Marine Sanctuary	2
Santa Cruz	U.C Santa Cruz	4
	Marine Mammal Center Volunteer (Nancy Scarborough)	4
	Santa Cruz County Environmental Heath Department	3
Monterey	Marine Mammal Center Volunteers (Aubrey St. Marie, Marie Brayman)	1
	Monterey Abalone Company	4
	Marine Pollution Studies Laboratory	4
San Luis Obispo	Morro Bay National Estuary Program	3
	CDHS Volunteers (Renee and Auburn Atkins)	4
	California Polytechnic State University	4
	NOAA Coastal Discovery Center, San Simeon	3
	Terera Environmental	2
	Marine Mammal Center Volunteers (Debby Davis, P.J. Webb, Teri Woodhouse, Marie Brayman)	13
Santa Barbara	Channel Islands National Marine Santuary	2
	National Park Service	2
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
	Vandenberg AFB	2
	Guided Discoveries, Catalina Tall Ships Expeditions	4
Ventura	CDHS Volunteer (Fred Burgess)	5
	Channel Islands National Marine Santuary	6
	Ventura County Environmental Heath Department	2
	National Park Service	3
	Guided Discoveries, Catalina Tall Ships Expeditions	1
Los Angeles	Los Angeles County Sanitation District	4
	Guided Discoveries, Catalina Tall Ships Expeditions	3
	Pt. Mugu Naval Air Station	1
	CDHS Volunteer (Richard Weaver)	1
Orange	DHS Volunteer (Debbie Karimoto)	1
	Aquarium of the Pacific, Long Beach	1
San Diego	Scripps Institute of Oceanography	6
	DHS Volunteer (Paul Sims, Claire Sims)	4
	Avian Research Associates	1

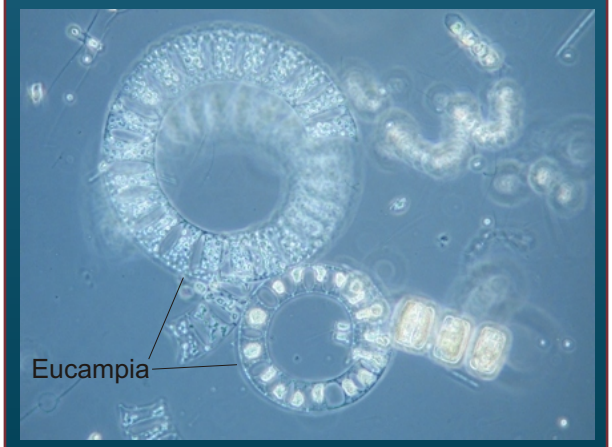
PHYTOPLANKTON GALLERY



The diatom Chaetoceros was common along most of the California coast in July.



The leaf-shaped dinoflagellate Prorocentrum was common at several sites between Marin and San Diego counties.



Coiled chains of Eucampia were common at sites between Monterey and San Luis Obispo.